

mounting the socket to a circuit board so as to compress the springs and to deform the conductive polymer.

55. (New) The method of claim 54 where the terminals are solderless.

56. (New) The method of claim 54 where the socket is mounted by adhering it to the circuit board.

REMARKS

Applicant has carefully reviewed and considered the Office Action mailed on December 17, 2002, and the references cited therewith. This amendment cancels claim 1-29 without prejudice and adds new claims 30-56, so that claims 30-56 are currently pending in the Application.

Previous claims 1-29 were rejected under 35 USC § 103(a) as being unpatentable over Smith et al. (U.S. Patent No. 4,620,761) in view of Daglow et al. (U.S. Patent No. 4,898,173), some further in view of Allen et al. (U.S. Patent No. 4,705,205) or Stopperan (U.S. Patent No. 5,719,749). New claims 30-56 present the invention in better form without narrowing the subject matter sought to be protected.

The invention combines two forms of electrical conductor in terminals located in vias of a socket. A major goal is to achieve low socket height and yet compensate for warpage of large-area surface that the socket couples to. Applicant has found that these two forms synergize to provide advantages that neither alone provides. For example, the compressibility of the spring compensates for uneven mating surfaces, but has relatively low current capability. The polymer is thicker, offering more current capability, although somewhat less compensation for mating. The spring has a relatively high inductance, while the polymer offers lower inductance, for better high-frequency performance. In addition, the polymer allows the spring to be placed in a constant-width via without falling out, whereas Smith requires stepped vias to prevent his springs from falling out, and Daglow requires a stepped lumen and insulating rings to prevent his polymer donuts from being pushed about. This offers a major advantage in manufacturability.

Independent claim 30 includes this concept in its recitation of a terminal having both “a spring extending through one of the vias” and “a conductive polymer in contact with the spring and with the one via.” *In re Lee*, 61 USPQ2d 1430 (Fed. Cir. 2002) requires a motivation within references themselves to combine them. Applicant does not find any suggestion in Smith or Daglow---or in Allen, for that matter---for combining a spring and a conductive polymer in any contact configuration, or for any reason. Smith---or Allen---mentions polymers not at all. Daglow mentions that ring-shaped spring contacts can be substituted for his conductive polymer rings, but presents no suggestion to combine them. In the “response to Arguments” section, page 6, the Action states:

“Applicant argues that Smith has no suggestion of a polymer and Daglow has no spring. However, Smith teaches all the instant limitations of the claimed invention, except for the polymer which is deposited within the vias.”

This statement does not even attempt to find a motivation for combining a spring and a conductive polymer in the same terminal of a socket, and therefore fails the test of *In re Lee*. Moreover, the claim recitations that the polymer be “in contact with the one spring” and in contact “with the one via” as well lie far afield from even an improper combination of the references.

Dependent claims 31-41 incorporate the recitations of parent claim 30, as present other features as well. For example, claim 33 declares that the vias “have a constant width.” The manufacturability advantages of constant width for inserting a terminal into a via seem great enough that Smith would have attempted it---if he knew how to achieve it. Claim 34 “fills the vias from side to side” with polymer, the mechanism by which the springs are retained therein, as shown in Figs. 1-4 of the Application. Daglow’s polymer donuts, of course, have apertures in the middle. Claim 35 fills them “from end to end” (also shown in Figs 1-4), whereas Daglow’s donuts extend only a very short distance along his lumen. The references to Allen and Stopperan fail to remedy any of the deficiencies of Smith and Daglow as to these claims.

Independent claim 42 covers a circuit assembly that incorporates the “spring” and “conductive polymer” conductors recited in claim 30. Claim 42 therefore distinguishes the Smith, Daglow, and Allen patents for the same reasons. Dependent claims 43-47 present additional features not found in the cited references.

Independent claim 48 is drawn to a method of constructing a socket according to the invention. This claim fabricates vias "having constant widths through" a socket body. Smith's vias have two different widths, 72 and 74, Fig. 9. Daglow's lumen 102, Fig. 2, has steps near elements 132, 116, and 106; lumen 202, Fig. 4, has even more steps. In both cases, the different widths are required for physical retention of terminals, whereas Applicant's terminals do not require such a function. Claim 48 also recites "injecting" a conductive polymer. Smith---and the Allen patent as well---employ no polymer at all. Daglow's polymer donuts could not be injected in place, but must be fabricated externally, then separately inserted into his connector body. Claim 48 further injects the polymer "so as to contact the springs and the sides of the vias." Smith suggests no polymer at any location, and therefore no relative placement of a polymer and a spring. Although Daglow may employ either a spring or a polymer ring as a contact, these are substitutes for each other, and are not used together; see col. 2 lines 16-18 and the descriptions of Figs. 4-6 at col. 6 lines 17-26 and at col. 6 line 44 to col. 7 line 30. Daglow thus does not suggest the relative placement of spring and polymer as recited in the claim. For these reasons, claim 48 defines a method not found even in an improper combination of the references.

Dependent claims 49-53 include additional features. For example, the Allen and Stopperan patents cannot supply the deficiencies of Smith and Daglow with respect to claims 50-53. Moreover, Applicant finds no suggestion of adhesives in these two references, so that their combination with Allen is motivated solely by Applicant's disclosure, in contravention of 35 U.S.C. §103.

Independent claim 54 covers a method of using a socket according to the invention. Claim 54 specifies that the socket includes terminals having both a "spring" and a "conductive polymer," which are neither found together nor suggested by the cited references, except in the light of Applicant's invention. Claim 54 then specifies a spatial relation not found in the references, that the conductive polymer is "in contact with the spring and with the one via." In the following element, claim 54 mounts the socket so as to "compress the springs *and* to deform the conductive polymer" (emphasis supplied). Again, Smith---nor Allen---has no polymer to be deformed; Daglow has either conductive polymer or springs, but not both.

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Dependent claims 55-56 incorporate the recitations of claim 54. Allen's terminals are not "solderless" as in claim 55. Any combination including Allen or Stopperan to attempt the "adhering" operation of claim 56 is improper under 35 U.S.C. §103 for the reasons given above.

Conclusion

Applicant urges that the claims are in condition for allowance, and respectfully requests reexamination under 35 U.S.C. §132 and notification to that effect. The Examiner is invited to telephone Applicant's attorney at 612-373-6971 to facilitate prosecution of this Application.

If necessary, please charge any additional fees or credit overpayment to Deposit Account No. 19-0743.

Respectfully submitted,

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CERTIFICATE UNDER 37 CFR 1.8: The undersigned hereby certifies that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail, in an envelope addressed to: Box AF, Commissioner of Patents, Washington, D.C. 20231, on this 10th day of February 2003.

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